

*Sub
C5
D1*
9. (Amended) A method for driving a liquid crystal display comprising the steps of:

displaying a plurality of frames in one second, wherein each of said frames is divided into subframes of a number that is an integer larger than 2, wherein each subframe comprises a red image, a green image and a blue image, and wherein backlights of red, green, and blue are provided corresponding to a timing of said red image, said green image and said blue image; and

compressing original video signals by $1/(3n)$ times in a time axis direction.

REMARKS

Applicant would like to thank the Examiner for the consideration given the above-identified application. The Examiner's Office Action of **September 26, 2002** has been received and its contents carefully noted. Concurrently filed herewith is a *Request for a Two (2) Month Extension of Time* that extends the shortened statutory period for response until February 26, 2002. Accordingly, Applicant respectfully submits that this response is timely filed and fully responsive to the Office Action.

Claims 1-45 were pending in this application prior to the aforementioned amendment. By the above actions, claims 1, 3, 6 and 9 are amended to better place them in condition for allowance. Applicant respectfully submits that no issue of new matter is presented by this amendment. Accordingly, claims 1-45 are pending in this application, and are believed to be in condition for allowance for at least the reasons stated below.

A. Drawing Objection

Applicant respectfully requests that the drawing objection be held in abeyance at least until a notice of allowance has been given.

B. 35 U.S.C. §103 Rejection

Initially, the Examiner rejects claims 1-9 under 35 U.S.C. §103(a) as unpatentable over *Applicant's Admitted Prior Art* in view of U.S. Patent No. 4,090,219 to *Ernstoff et al.* (Hereinafter “*Ernstoff*”), claims 10-31 under 35 U.S.C. §103(a) as unpatentable over *Applicant's Admitted Prior Art* in view of *Ernstoff* and U.S. Patent No. 5,528,262 to *McDowall et al.* (Hereinafter “*McDowall*”), claims 32-34 under 35 U.S.C. §103(a) as unpatentable over *Applicant's Admitted Prior Art* in view of *Ernstoff* and U.S. Patent No. 5,327,229 to *Konno et al.* (Hereinafter “*Konno*”), and claims 35-45 under 35 U.S.C. §103(a) as unpatentable over *Applicant's Admitted Prior Art* in view of *Ernstoff, Konno and McDowall*.

Applicant traverses these rejections at least as to claims 32-45. Regarding claims 1-31, Applicant respectfully contends that the claimed invention as presently amended defines subject matter which is clearly patentably distinct over the prior art. More particularly, it is contended that the proposed combination presented in the Office Action fails to expressly teach or implicitly suggest every limitation of the claimed invention necessary to support *prima facie* obviousness under 35 U.S.C. §103(a).

Independent claim 1 of the claimed invention is directed generally to a driving method for a liquid crystal display, wherein one image frame comprises n (n being an integer of 2 or more) subframes, each of which comprises a red image, a green image and a blue image, and a red, a green or a blue backlight turns on corresponding to display of the red image, the green image or the blue image, said method comprising a step of compressing original video signals by 1/(3n) times in a time axis direction. Accordingly, as illustrated at least by FIG. 2, one image frame Tf is divided into a plurality of subframes, and during each subframe, three color images of red, green and blue are sequentially displayed.

Independent claim 3 of the claimed invention is directed generally to a liquid crystal display, including, *inter alia*, at least one backlight for feeding red light, green light and blue light, and an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section.

Independent claim 6 of the claimed invention is directed generally to a liquid crystal display comprising at least one backlight comprising a red LED, a green LED and a blue LED, a display section for displaying an image when voltage is applied to a liquid crystal, and an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section. In accordance with the claimed invention, the display section displays a plurality of frames in one second, each of the frames comprising n (n is an integer of 2 or more) subframes, each of which comprises a red image, a green image and a blue image, the red LED, the green LED, or the blue LED feeding light to the display section when the red image, the green image or the blue image is to be displayed.

Independent claim 9 of the claimed invention is directed generally to a method for driving a liquid crystal display comprising the steps of displaying a plurality of frames in one second, each of the frames being divided into subframes of a number that is an integer larger than 2, each subframe being comprised of a red image, a green image and a blue image, and whereby backlights of red, green, and blue are provided corresponding to a timing of the red image, the green image and the blue image, and compressing original video signals by $1/(3n)$ times in a time axis direction.

Independent claims 32-34 of the claimed invention are each directed generally to a method for displaying a liquid crystal display comprising the step of compressing an original red, green and blue video signal, respectively entered from outside by $1/(3n)$ times into a respective red, green and blue video signal, “ n ” being an integer larger than 2 and represents a number of subframes comprising a single frame.

Referring initially to the rejection of claims 1-31, it is contended that the alleged **Admitted Prior Art**, either alone or in view of **Ernstoff** or **McDowall**, fails to expressly disclose or inherently suggest the claimed invention as presently amended. For instance, the Examiner finds that the alleged **Admitted Prior Art** discloses a field sequential driving method in which one image frame is divided into three subframes and each one of the red, green and blue backlights are turned on for one-third frame duration. The alleged **Admitted Prior Art**, however, fails to disclose an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section for compressing original video signals by 1/(3n) times in a time axis direction, as presently set forth independent claims 1, 3, 6 and 9 of the claimed invention.

While the **Ernstoff** patent allegedly discloses a liquid crystal field display in which one image frame comprises a red image, a green image and a blue image, it fails to modify this deficiency in the alleged **Admitted Prior Art** since it too fails to expressly teach or disclose an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section for compressing original video signals by 1/(3n) times in a time axis direction. The **McDowall** patent also fails to disclose such a feature.

Inasmuch as it is believed that the proposed **Admitted Prior Art-Ernstoff-McDowall** combination fails to expressly teach or implicitly suggests each and every claim feature as presently set forth in independent claims 1, 3, 6 and 9, *prima facie* obviousness cannot result from their proposed combination. Accordingly, consideration of the amended claims and withdrawal of the rejections are respectfully solicited.

Referring to the rejection of claims 32-34 in the Office Action, it is contended that the alleged **Admitted Prior Art**, either alone or in view of **Ernstoff**, **Konno** and/or **McDowall**, fails to expressly disclose or inherently suggest the claimed invention. In particular, the Examiner mischaracterizes the "Related Art" section of Applicant's

“Background of the Invention.” For instance, the Examiner finds that the alleged ***Admitted Prior Art*** discloses the invention substantially as claimed, including an admission of the conventional nature of a field sequential driving method in which one image frame is divided into three subframes and each one of the red, green and blue backlights are turned on for one-third frame duration.

It should be noted, however, that Applicant attempts to overcome the deficiencies in this conventional sequential method, which has an operational defect due to the fact that the red, green and blue images are each displayed once for one-third the duration of one frame. Such a design results in a flicker of the screen, which is very undesirable.

Therefore, in accordance with the claimed invention defined in claims 32-45, the present inventors sought to overcome this deficiency by dividing one frame into plural subframes so as to sequentially display the three color images in each subframe. As shown in Fig. 5 of Applicant’s detailed drawings, this concept is realized by providing an n-speed field sequential color signal generation circuit 403 which compresses original video signals R, G and B by $1/(3n)$ times in a time axis direction.

Hence, there is no admission for a liquid crystal display comprising a step of compressing an original red, green and blue video signal, respectively entered from outside by $1/(3n)$ times into a respective red, green and blue video signal. In addition, the secondary ***Ernstoff, McDowall*** and ***Konno*** references fail to modify this deficiency since neither teaches or discloses such a feature.

Applicant further contends that dependent claims 35-45 are believed to be patentably distinct over the cited prior art references since they incorporate by reference each and every feature of independent claims 32-34. Therefore, Applicant requests reconsideration and withdrawal of the rejections with respect to claims 32-45.

Conclusion

Because the claimed invention as presently amended clearly defines over the prior art of record, Applicant respectfully requests reconsideration and withdrawal of the rejection. Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



Jeffrey L. Costellia
Registration No. 35,483
NIXON PEABODY LLP
8180 Greensboro Drive, Suite 800
McLean, Virginia 22102
(703) 790-9110

JLC/TAV:gjc

MARKED-UP COPY OF AMENDED CLAIMS

1. (Amended) A driving method for a liquid crystal display, wherein one image frame comprises n (n is an integer of 2 or more) subframes, each of which comprises a red image, a green image and a blue image, and wherein a red, a green or a blue backlight turns on corresponding to display of the red image, the green image or the blue image, said method comprising the step of:

compressing original video signals by $1/(3n)$ times in a time axis direction.

3. (Amended) A liquid crystal display comprising:

[backlights] at least one backlight for feeding red light, green light and blue light; [and]

a display section for displaying an image when voltage is applied to a liquid crystal; and

an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section,

wherein the display section displays a plurality of frames in one second, each of which comprises n (n is an integer of 2 or more) subframes, each of said n subframes [comprises] comprising a red image, a green image and a blue image, and said [backlights feed] at least one backlight feeds red light, green light or blue light to the display section when the red image, the green image or the blue image is to be displayed.

6. (Amended) A liquid crystal display comprising:

[backlights] at least one backlight comprising a red LED, a green LED and a blue LED; [and]

a display section for displaying an image when voltage is applied to a liquid crystal; and

an n-speed field sequential color signal generation circuit operationally connected to said at least one backlight and said display section,

wherein the display section displays a plurality of frames in one second, each of the frames [comprises] comprising n (n is an integer of 2 or more) subframes, each of which comprises a red image, a green image and a blue image, and wherein the red LED, the green LED, or the blue LED feeds light to the display section when the red image, the green image or the blue image is to be displayed.

9. (Amended) A method for driving a liquid crystal display comprising the steps of:

displaying a plurality of frames in one second, wherein each of said frames is divided into subframes of a number that is an integer larger than 2, wherein each subframe comprises a red image, a green image and a blue image, and wherein backlights of red, green, and blue are provided corresponding to a timing of said red image, said green image and said blue image; and

compressing original video signals by $1/(3n)$ times in a time axis direction.